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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

|                             |   |                        |
|-----------------------------|---|------------------------|
| In re Application of:       | ) | Art Unit: 1623         |
|                             | ) |                        |
| FRANCH, et al.              | ) | Examiner:              |
|                             | ) |                        |
| Serial No.: 10/549,619      | ) | Washington, D.C.       |
|                             | ) |                        |
| Filed: February 28, 2006    | ) | October 10, 2006       |
|                             | ) |                        |
| For: LIGATIONAL ENCODING OF | ) | Docket No.: FRANCH=4A  |
| SMALL MOLECULES             | ) |                        |
|                             | ) | Confirmation No.: 8187 |

INFORMATION DISCLOSURE STATEMENT [IDS]

U.S. Patent and Trademark Office  
Customer Service Window  
Randolph Building  
401 Dulany Street  
Alexandria, VA 22314

S i r :

This Information Disclosure Statement is submitted in accordance with 37 C.F.R. 1.97, 1.98, and it is requested that the information set forth in this statement and in the listed documents be considered during the pendency of the above-identified application, and any other application relying on the filing date of the above-identified application or cross-referencing it as a related application.

1. This IDS should be considered, in accordance with 37 C.F.R. 1.97, as it is filed:

☐ A. within three months of the filing date of the above-identified national application or within three months of the entry into the national stage of the above-identified international application. See 37 CFR 1.97(b)(1) and (3).

☒ B. before the mailing date of a first office action on the merits. See 37 CFR 1.97(b).

☐ C. after (A) and (B) above, but before final rejection or allowance, and Applicants have made the necessary certification (box "i" below) or paid the necessary fee (box "ii" below). See 37 CFR 1.97(c)(2).

☐ i. Counsel certifies that, upon information and

belief, each item of information listed herein was either (a) cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this IDS or (b) was not cited in a communication from a foreign patent office in a counterpart foreign application and was not known to any individual designated in 1.56(c) more than three months prior to the filing of this IDS.

[ ] ii. Credit Card Payment Form, PTO-2038, authorizing payment for the fee set forth in 1.17(p), presently believed to be \$180, is attached.

[ ] D. after (A), (B) and (C) above, but before payment of the issue fee. Applicant petitions under 37 C.F.R. 1.97(d) for consideration of this IDS. A Credit Card Payment Form, PTO-2038, authorizing payment for the fee set forth in 1.17(p)(1), presently believed to be \$180 is attached. Counsel certifies that, upon information and belief, each item of information listed herein was either (i) cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this IDS or (ii) was not cited in a communication from a foreign patent office in a counterpart foreign application and was not known to any individual designated in 1.56(c) more than three months prior to the filing of this IDS.

[ ] E. As a submission in accordance with the transitional procedure for limited examination after final rejection pursuant to 37 CFR §1.129(a). Pursuant to MPEP §706.07(g), page 700-66, col. 2 (August 2001), this IDS is treated as if filed with a period set forth in 37 CFR §1.97(b) and considered without the petition and petition fee required by 1.97(d).

[ ] F. As a submission with or after a request for continued examination under CFR §1.114, and before the mailing of a first office action on the RCE. See 37 CFR §1.97(b)(4).

2. In accordance with 37 C.F.R. 1.98, this IDS includes a

list (e.g., form PTO-1449) of all patents, publications, or other information submitted for consideration by the office, either incorporated into this IDS or as an attachment hereto. A copy of each document is attached, except as explained below.

[ ] While an IDS filed under §1.97 must contain a "list of all patents, publications or other information submitted for consideration by the Office", see §1.98(a) (1), the only requirement for the list is that it provide the information set forth in §1.98(b). There is no requirement that a form PTO-1449 be used (MPEP §609 merely says that use of this form is "encouraged"). Counsel has used a list provided to him by Applicants, and not transferred the information to a PTO-1449, to avoid the risk of any inadvertent error in transferring the information.

[X] A. Documents AA-BJ are U.S. Patents or U.S. Patent Publications, and hence copies of these documents have not been provided. See 37 CFR 1.98(a)(2)(ii).

[ ] B. Documents \_\_\_\_\_ are deemed substantially cumulative to documents \_\_\_\_\_, and, in accordance with 1.98(c), only a copy of each of the latter documents is enclosed.

[ ] C. Certain documents were previously cited by or submitted to the Office in the following prior application(s), which are relied upon under 35 U.S.C. 120:

[insert serial number/filing date]

Applicants identify these documents by attaching hereto copies of the form PTO-892s and PTO-1449s from the files of the prior applications or a fresh PTO-1449 listing these documents, and request that they be considered and made of record in accordance with 1.98(d). Per 37 CFR 1.98(d), copies of these documents need not be filed in this application. If copies of any of these documents cannot be found in the files of the prior applications, the Examiner is requested to so notify counsel before taking action in this case, so replacement copies can be submitted. While an IDS filed under §1.97 must contain a "list of all patents, publications or other information submitted for

consideration by the Office", see §1.98(a) (1), the only requirement for the list is that it provide the information set forth in §1.98(b). There is no requirement that a form PTO-1449 be used (MPEP §609 merely says that use of this form is "encouraged") and no prohibition on submitting a copy of a form PTO-1449 or form PTO-892 from a prior case. Indeed, the re-use of such forms is desirable as it avoids error in transferring the information, and evidences that the reference was considered in a prior application. A previously accepted PTO-1449, or an examiner-prepared PTO-892, necessarily complies with §1.98(b).

[ ] 3. Documents \_\_\_\_\_ are not in the English language. In accordance with 1.98(a) (3), Applicants state:

[ ] documents \_\_\_\_\_ already contain an English language abstract, summary or claim set.

[ ] a publicly available abstract is attached to each of documents \_\_\_\_, and the source of each abstract is indicated thereon.

[ ] documents \_\_\_\_\_ are publicly available English language abstracts of foreign language patents. If the Examiner would like us to obtain a copy of the underlying document, with or without a translation, s/he should contact Counsel.

[ ] documents \_\_\_\_ are patents or published patent applications for which counterpart English language patents or patent applications exist, and are enclosed, as follows:

| <u>Foreign Lang. Doc.#</u> | <u>English Lang. Doc.#</u> |
|----------------------------|----------------------------|
|----------------------------|----------------------------|

[insert]

[insert]

[ ] applicants have prepared an English translation of at least the pertinent portions of documents \_\_\_\_\_, and copies are attached.

[ ] A concise explanation of the relevance of documents \_\_\_\_\_ is found in the attached search report from the \_\_\_\_\_ Patent Office (see reply to Comment 68 in the preamble to the final rules; 1135 OG 13 at 20).

[ ] A concise explanation of the relevance of documents \_\_\_\_\_ appears in the present specification.

[ ] A concise explanation of the relevance of documents \_\_\_\_\_ is set forth as follows:

[Insert concise explanation of relevance]

4. No explanation of relevance is necessary for documents in the English language (see reply to Comments 67 and 68 in the preamble to the final rules; 1135 OG 13 at 20).

5. If the month of publication of a nonpatent reference is not stated, it is because it is not apparent from review of the reference. If requested to do so by the Examiner, Applicants will attempt to locate and write to the publisher.

If the publication date of a cited document is set forth only as a publication year, and that year is prior to the year of filing or, if priority is claimed, year of priority of this application, then the particular month of publication is not in issue. Likewise if that publication year is after the year of filing of this application, the month of publication is not in issue.

If the date of publication of a nonpatent reference is stated, then, except as explained below, it is the nominal date stated in the reference, or in a larger document (journal or book) from which the reference was extracted. Applicants reserve the right to challenge this date by contacting the publisher to determine the actual shipment date, or by contacting recipients to determine the receipt dates.

6. Other information being provided for the examiner's consideration follows:

[insert other information]

7. In accordance with 37 C.F.R. 1.97(g) and (h), the filing of this IDS should not be construed as a representation that a search has been made or that information cited is, or is considered to be, material to patentability as defined in §1.56 (b), or that any cited document listed or attached is (or constitutes) prior art. Unless otherwise indicated, the date of

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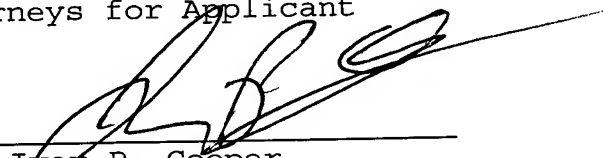
publication indicated for an item is taken from the face of the item and Applicant reserves the right to prove that the date of publication is in fact different.

8. The Commissioner is hereby authorized and requested to charge any additional fees which may be required in connection with this paper or credit any overpayment to Deposit Account No. 02-4035.

Respectfully submitted,

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SUBSTITUTE FOR FORM IPC/SB/08

INFORMATION DISCLOSURE STATEMENT  
LIST OF DOCUMENTS CITED BY APPLICANT

ATTY DOCKET NO: FRANCH=4A

SERIAL NO: 10/549,619

FIRST INVENTOR: FRANCH, Thomas

FILING DATE: February 28, 2006

ART UNIT: 1623

U.S. PATENT DOCUMENTS (include at least patentee, patent number and issue date)

| EXAMINER<br>INITIAL |    | DOCUMENT NUMBER |    |    |    |   |   |   | DATE                       | PATENTEE               |  |  | FILING DATE<br>IF APPROP. |
|---------------------|----|-----------------|----|----|----|---|---|---|----------------------------|------------------------|--|--|---------------------------|
|                     | AA | 6               | 4  | 2  | 9  | 3 | 0 | 0 | Aug 6, 2002                | Kurz, M et al.         |  |  |                           |
|                     | AB | 6               | 2  | 0  | 7  | 4 | 4 | 6 | Mar 27, 2001               | Szostak, J et al.      |  |  |                           |
|                     | AC | 6               | 1  | 4  | 3  | 5 | 0 | 3 | Nov 7, 2000                | Baskerville, DS et al. |  |  |                           |
|                     | AD | 6               | 6  | 2  | 0  | 5 | 8 | 7 | Sept 16, 2002              | Taussig, MJ et al.     |  |  | May 28, 1998              |
|                     | AE | 20              | 03 | 00 | 04 | 1 | 2 | 2 | Jan 2, 2003                | Beigelman et al.       |  |  | April 4, 2001             |
|                     | AF | 6               | 5  | 9  | 3  | 0 | 8 | 8 | Jul 15, 2003               | Saito, I et al.        |  |  | Aug 24, 2000              |
|                     | AG | 5               | 5  | 7  | 1  | 9 | 0 | 3 | Nov 5, 1991                | Gryaznov, SM et al.    |  |  |                           |
|                     | AH | 5               | 4  | 7  | 6  | 9 | 3 | 0 | Dec 19, 1995               | Letsinger, RL et al.   |  |  |                           |
|                     | AI | 5               | 6  | 8  | 1  | 9 | 4 | 3 | Oct 28, 1997               | Letsinger, RL et al.   |  |  |                           |
|                     | AJ | 5               | 7  | 8  | 0  | 6 | 1 | 3 | Jul 14, 1998               | Letsinger, RL et al.   |  |  |                           |
|                     | AK | 5               | 7  | 4  | 1  | 6 | 4 | 3 | Apr 21, 1998               | Gryaznov, SM et al.    |  |  |                           |
|                     | AL | 5               | 8  | 3  | 0  | 6 | 5 | 8 | Nov 3, 1998                | Gryaznov, SM et al.    |  |  |                           |
|                     | AM | 5               | 8  | 4  | 3  | 6 | 5 | 0 | Dec 1, 1998                | Segev, D               |  |  |                           |
|                     | AN | 5               | 5  | 0  | 3  | 8 | 0 | 5 | Apr 2, 1993                | Sugarman et al.        |  |  |                           |
|                     | AO | 5               | 6  | 3  | 9  | 6 | 0 | 3 | Jun 17, 1997               | Dower et al.           |  |  |                           |
|                     | AP | 5               | 6  | 6  | 5  | 9 | 7 | 5 | Sep 9, 1997                | Kedar et al.           |  |  |                           |
|                     | AQ | 5               | 7  | 0  | 8  | 1 | 5 | 3 | Jan 13, 1998               | Dower et al.           |  |  |                           |
|                     | AR | 5               | 7  | 7  | 0  | 3 | 5 | 8 | Jun 23, 1998               | Dower et al.           |  |  |                           |
|                     | AS | 5               | 7  | 8  | 9  | 1 | 6 | 2 | Aug 4, 1998                | Dower et al.           |  |  |                           |
|                     | AT | 6               | 0  | 5  | 6  | 9 | 2 | 6 | May 2, 2000                | Sugarman et al.        |  |  | July 23, 1996             |
|                     | AU | 6               | 1  | 4  | 0  | 4 | 9 | 3 | Oct 31, 2000               | Dower et al.           |  |  | Sept 11, 1998             |
|                     | AV | 6               | 1  | 4  | 3  | 4 | 9 | 7 | Nov 2, 2000                | Dower et al.           |  |  | Mar 6, 1998               |
|                     | AW | 6               | 1  | 6  | 5  | 7 | 1 | 7 | Dec 26, 2000               | Dower et al.           |  |  | May 13, 1998              |
|                     | AX | 6               | 1  | 6  | 5  | 7 | 7 | 8 | Dec 26, 2000               | Kedar et al.           |  |  | Jul 2, 1998               |
|                     | AY | 6               | 4  | 1  | 6  | 9 | 4 | 9 | July 9, 2002               | Dower et al.           |  |  | Feb 24, 1999              |
|                     | AZ | 5               | 5  | 7  | 3  | 9 | 0 | 5 | Nov. 12, 1996              | Lerner, RL et al.      |  |  |                           |
|                     | BA | 5               | 7  | 2  | 3  | 5 | 9 | 8 | Mar 3, 1998                | Lerner, RL et al.      |  |  |                           |
|                     | BB | 6               | 0  | 6  | 0  | 5 | 9 | 6 | May 9, 2000                | Lerner, R et al.       |  |  | Mar 3, 1998               |
|                     | BC | 4               | 8  | 2  | 2  | 7 | 3 | 1 | April 18, 1989             | Watson et al.          |  |  |                           |
|                     | BD | 6               | 2  | 9  | 7  | 0 | 5 | 3 | October 2, 2001            | Stemmer                |  |  |                           |
|                     | BE | 20              | 05 | 00 | 25 | 7 | 6 | 6 | February 2, 2005           | Liu et al.             |  |  |                           |
|                     | BF | 20              | 05 | 00 | 42 | 6 | 6 | 9 | February 24, 2005          | Liu et al.             |  |  |                           |
|                     | BG | 20              | 05 | 00 | 42 | 6 | 6 | 9 | Published 24 February 2005 | Liu, David R           |  |  |                           |
|                     | BH | 20              | 05 | 00 | 25 | 7 | 6 | 6 | Published 3 February 2005  | Liu, David R           |  |  |                           |
|                     | BI | 20              | 05 | 14 | 2  | 5 | 8 | 3 | 30 June 2005               | Liu, David R           |  |  |                           |
|                     | BJ | 20              | 05 | 17 | 0  | 3 | 7 | 6 | 4 Aug 2005                 | Liu, David R           |  |  |                           |

EXAMINER

DATE CONSIDERED

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ATTY DOCKET NO: FRANCH=4A

SERIAL NO: 10/549,619

INFORMATION DISCLOSURE STATEMENT  
LIST OF DOCUMENTS CITED BY APPLICANT

FIRST INVENTOR: FRANCH, Thomas

FILING DATE: February 28, 2006

ART UNIT: 1623

FOREIGN PATENT DOCUMENTS (include at least document number, publication date and country)

|  |       | DOCUMENT NUMBER |    |    |   |   |   |    | DATE            | COUNTRY | CLASS | SUB-CLASS | TRANSLATION YES/NO |
|--|-------|-----------------|----|----|---|---|---|----|-----------------|---------|-------|-----------|--------------------|
|  | BK    | 9               | 3  | 0  | 3 | 1 | 7 | 2  | 18 Feb 1993     | PCT     |       |           |                    |
|  | BL    | 9               | 8  | 3  | 1 | 7 | 0 | 0  | 23 July 1998    | PCT     |       |           |                    |
|  | BM    | 0               | 0  | 3  | 2 | 8 | 2 | 3  | 8 June 2000     | PCT     |       |           |                    |
|  | BN    | 9               | 0  | 4  | 7 | 7 | 7 | 5  | 17 Aug 2000     | PCT     |       |           |                    |
|  | BO    | 9               | 0  | 0  | 5 | 7 | 6 | 5  | 31 May 1990     | PCT     |       |           |                    |
|  | BP    | 0               | 3  | 2  | 4 | 6 | 1 | 6  | 19 July 1989    | EP      |       |           |                    |
|  | BQ    | 9               | 6  | 3  | 5 | 6 | 9 | 9  | 14 Nov 1996     | PCT     |       |           |                    |
|  | BR    | 0               | 6  | 9  | 5 | 3 | 0 | 5  | 27 October 1994 | EP      |       |           |                    |
|  | BS    | 0               | 0  | 6  | 1 | 7 | 7 | 5  | 19 October 2000 | PCT     |       |           |                    |
|  | BT    | 0               | 5  | 0  | 4 | 9 | 9 | 2  | 1 April 1993    | EP      |       |           |                    |
|  | BU    | 9               | 5  | 1  | 2 | 6 | 9 | 8  | 11 May 1995     | PCT     |       |           |                    |
|  | BV    | 0               | 7  | 7  | 3 | 2 | 2 | 7  | 14 May 1997     | EP      |       |           |                    |
|  | BW    | 0               | 7  | 7  | 6 | 3 | 3 | 9  | 4 October 1996  | EP      |       |           |                    |
|  | BX    | 0               | 6  | 4  | 3 | 7 | 7 | 8  | 14 Oct. 1993    | EP      |       |           |                    |
|  | BY    | 0               | 0  | 2  | 3 | 4 | 5 | 8  | 27 April 2000   | PCT     |       |           |                    |
|  | BZ    | 0               | 2  | 0  | 7 | 4 | 9 | 29 | 26 Sept 2002    | PCT     |       |           |                    |
|  | CA    | 20              | 04 | 01 | 6 | 7 | 6 | 7  | 26 Feb 2004     | PCT     |       |           |                    |
|  | CB    | 9               | 6  | 5  | 6 | 9 | 0 | 4  | 17 Dec. 1998    | PCT     |       |           |                    |
|  | CC    | 0               | 1  | 0  | 0 | 6 | 7 | 6  | 4 Jan. 2001     | PCT     |       |           |                    |
|  | CD    | 9               | 6  | 1  | 2 | 0 | 1 | 4  | 25 April 1996   | PCT     |       |           |                    |
|  | TM 1  | 02              | 1  | 0  | 3 | 0 | 0 | 8  | 27 Dec 2002     | PCT     |       |           |                    |
|  | TM 2  | 02              | 1  | 6  | 2 | 8 | 2 | 0  | 27 Dec 2002     | PCT     |       |           |                    |
|  | TM 3  | 03              | 0  | 7  | 8 | 6 | 2 | 5  | 25 Sept 2003    | PCT     |       |           |                    |
|  | TM 4  | 20              | 04 | 01 | 3 | 0 | 7 | 0  | 12 Feb 2004     | PCT     |       |           |                    |
|  | TM 5  | 20              | 04 | 11 | 0 | 9 | 6 | 4  | 23 12 2004      | PCT     |       |           |                    |
|  | TM 6  | 20              | 04 | 02 | 4 | 9 | 2 | 9  | 25 March 2004   | PCT     |       |           |                    |
|  | TM 7  | 20              | 04 | 05 | 6 | 3 | 9 | 4  | 8 July 2004     | PCT     |       |           |                    |
|  | TM 8  | 20              | 04 | 00 | 3 | 8 | 1 | 4  | 29 Jan 2004     | PCT     |       |           |                    |
|  | TM 10 | 03              | 0  | 7  | 8 | 4 | 4 | 5  | 25 Sept. 2003   | PCT     |       |           |                    |
|  | TM 13 | 03              | 0  | 7  | 8 | 6 | 2 | 6  | 25 Sept 2003    | PCT     |       |           |                    |
|  | TM 14 | 20              | 04 | 00 | 1 | 0 | 4 | 2  | 31 Dec 2003     | PCT     |       |           |                    |
|  | TM 15 | 03              | 6  | 7  | 8 | 0 | 5 | 0  | 25 Sept 2003    | PCT     |       |           |                    |
|  | TM 16 | 03              | 0  | 7  | 8 | 4 | 4 | 6  | 25 Sept 2003    | PCT     |       |           |                    |
|  | TM 17 | 03              | 0  | 7  | 8 | 6 | 2 | 7  | 25 Sept 2003    | PCT     |       |           |                    |
|  | TM 18 | 20              | 04 | 07 | 4 | 5 | 0 | 1  | 2 Sept 2004     | PCT     |       |           |                    |

EXAMINER

DATE CONSIDERED

EXAMINER: initial if reference considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.



|   |       |  |    |    |   |   |   |   |                                |     |  |                       |  |                |
|---|-------|--|----|----|---|---|---|---|--------------------------------|-----|--|-----------------------|--|----------------|
| SUBSTITUTE FOR FORM IPC/SB/08   |       |  |    |    |   |   |   |   | ATTY DOCKET NO: FRANCH=4A      |     |  | SERIAL NO: 10/549,619 |  |                |
| INFORMATION DISCLOSURE STATEMENT<br>LIST OF DOCUMENTS CITED BY APPLICANT  |       |  |    |    |   |   |   |   | FIRST INVENTOR: FRANCH, Thomas |     |  |                       |  |                |
|   |       |  |    |    |   |   |   |   | FILING DATE: February 28, 2006 |     |  |                       |  | ART UNIT: 1623 |
| FOREIGN PATENT DOCUMENTS (include at least document number, publication date and country)   |       |  |    |    |   |   |   |   |                                |     |  |                       |  |                |
|   | TM 19 | 20   | 04 | 07 | 4 | 4 | 2 | 9 | 2 Sept 2004                    | PCT |  |                       |  |                |
|   | TM 20 | 20   | 04 | 08 | 3 | 4 | 2 | 7 | 30 Sept 2004                   | PCT |  |                       |  |                |
|   | TM 21 | 1  | 5  | 3  | 3 | 3 | 8 | 5 | 25 May, 2005                   | EP  |  |                       |  |                |
|   | TM 22 | 20   | 05 | 00 | 3 | 7 | 7 | 9 | 13 Jan 2005                    | PCT |  |                       |  |                |
|   | TM 23 | 20   | 04 | 03 | 9 | 8 | 2 | 5 | 13 May 2004                    | PCT |  |                       |  |                |
|   | TM 24 | 20   | 05 | 02 | 6 | 3 | 8 | 7 | 24 March 2005                  | PCT |  |                       |  |                |
|   | CE    | 20   | 04 | 09 | 9 | 4 | 4 | 1 | 18 Nov 2004                    | PCT |  |                       |  |                |
|   | CF    | 03   | 0  | 8  | 2 | 9 | 0 | 1 | 9 Oct 2003                     | PCT |  |                       |  |                |
|   | CG    | 9  | 1  | 0  | 5 | 0 | 5 | 8 | 18 April 1991                  | PCT |  |                       |  |                |
|   | CH    | 9  | 6  | 0  | 9 | 3 | 1 | 6 | March 28, 1996                 | PCT |  |                       |  |                |
|   | CI    | 0  | 0  | 2  | 1 | 9 | 0 | 9 | April 20, 2000                 | PCT |  |                       |  |                |
|   | CK    | 9  | 9  | 5  | 1 | 7 | 7 | 3 | Oct 14 1999                    | PCT |  |                       |  |                |
|   | CL    | 20   | 06 | 04 | 8 | 0 | 2 | 5 | 11 May 2006                    | PCT |  |                       |  |                |
|   | GS    | 20   | 06 | 05 | 3 | 5 | 7 | 1 | 26 May 2006                    | PCT |  |                       |  |                |
|   | ISR1  | 9  | 5  | 0  | 4 | 1 | 6 | 0 | 9 Feb. 1995                    | PCT |  |                       |  |                |
| OTHER DOCUMENTS (include author, title, name of publication, volume, pages & date of publication)   |       |  |    |    |   |   |   |   |                                |     |  |                       |  |                |
|   | CM    | Nemoto, N et al. "In vitro virus: bonding of mRNA bearing puromycin at the 3'-terminal end to the C-terminal end of its encoded protein on the ribosome in vitro". FEBS Lett. 1997 Sep 8;414(2):405-8.   |    |    |   |   |   |   |                                |     |  |                       |  |                |
|   | CN    | Roberts, RW et al. "RNA-peptide fusions for the in vitro selection of peptides and proteins". Proc Natl Acad Sci U S A. 1997 Nov 11;94(23):12297-302.  |    |    |   |   |   |   |                                |     |  |                       |  |                |
|   | CO    | Kurz, M et al. "An efficient synthetic strategy for the preparation of nucleic acid-encoded peptide and protein libraries for in vitro evolution protocols" Fourth International Electronic Conference on Synthetic Organic Chemistry (ECSOC-4), <a href="http://www.mdpi.org/ecsoc-4.htm">www.mdpi.org/ecsoc-4.htm</a> , September 1-30, 2000 |    |    |   |   |   |   |                                |     |  |                       |  |                |
|   | CP    | Kurz, M et al. "Psoralen photo-crosslinked mRNA-puromycin conjugates: a novel template for the rapid and facile preparation of mRNA-protein fusions. Nucleic Acids Res. 2000 Sep 15;28(18):E83.  |    |    |   |   |   |   |                                |     |  |                       |  |                |
|   | CQ    | Keiler et al. "Role of a peptide tagging system in degradation of proteins synthesized from damaged messenger RNA". Science. 1996 Feb 16;271(5251):990-3.  |    |    |   |   |   |   |                                |     |  |                       |  |                |
|   | CR    | Benner, SA. "Expanding the genetic lexicon: incorporating non-standard amino acids into proteins by ribosome-based synthesis". Trends Biotechnol. 1994 May;12(5):158-63  |    |    |   |   |   |   |                                |     |  |                       |  |                |
|   | CS    | Mendel, D." Site-directed mutagenesis with an expanded genetic code". Annu. Rev. Biophys. Biomol. Struc. 1995. 24:463-93   |    |    |   |   |   |   |                                |     |  |                       |  |                |
|   | CT    | Liu DR et al. "Engineering a tRNA and aminoacyl-tRNA synthetase for the site-specific incorporation of unnatural amino acids into proteins in vivo". Proc Natl Acad Sci U S A. 1997 Sep 16;94(19):10092-7.   |    |    |   |   |   |   |                                |     |  |                       |  |                |
|   | CU    | Liu DR et al. "Progress toward the evolution of an organism with an expanded genetic code". Proc Natl Acad Sci USA. 1999 Apr 27;96(9):4780-5   |    |    |   |   |   |   |                                |     |  |                       |  |                |
|   | CV    | Liu, R et al. "Optimized synthesis of RNA-protein fusions for in vitro protein selection". Methods Enzymol. 2000;318:268-93.   |    |    |   |   |   |   |                                |     |  |                       |  |                |
|   | CW    | Wang, L et al. "A new functional suppressor tRNA/aminoacyl-tRNA synthetase pair for the in vivo incorporation of unnatural amino acids into proteins" J. Am. Chem. Soc. 2000, 122, 5010-5011 Pub 5 April 2000  |    |    |   |   |   |   |                                |     |  |                       |  |                |
|   | CX    | Ellman J.A., et al. " Biosynthetic method for introducing Unnatural Amino acids site specifically into proteins". Methods Enzymol. 202, 301-336 (1992)   |    |    |   |   |   |   |                                |     |  |                       |  |                |
|   | CY    | José Salas et al. "Biosynthetic Polydeoxynucleotides as Direct Templates for Polypeptide Synthesis". J. of Biological Chemistry, vol.243, No. 6, 1968, p. 1012-1015  |    |    |   |   |   |   |                                |     |  |                       |  |                |
|   | CZ    | Walder JA, Walder RY, Heller MJ, Freier SM, Letsinger RL, Klotz IM. "Complementary carrier peptide synthesis: general strategy and implications for prebiotic origin of peptide synthesis". Proc Natl Acad Sci U S A. 1979 Jan;76(1):51-5.   |    |    |   |   |   |   |                                |     |  |                       |  |                |
|   | DA    | Bruick et al. "Template-directed ligation of peptides to oligonucleotides" Chemistry and Biology, vol. 3, No. 1, January 1996, p.49-56;  |    |    |   |   |   |   |                                |     |  |                       |  |                |
|   | DB    | Tamura K, Schimmel P. "Oligonucleotide-directed peptide synthesis in a ribosome- and ribozyme-free system". Proc Natl Acad Sci U S A. 2001 Feb 13;98(4):1393-7.  |    |    |   |   |   |   |                                |     |  |                       |  |                |
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| INFORMATION DISCLOSURE STATEMENT<br>LIST OF DOCUMENTS CITED BY APPLICANT  |    | FIRST INVENTOR: FRANCH, Thomas  |                       |
|   |    | FILING DATE: February 28, 2006  | ART UNIT: 1623        |
| OTHER DOCUMENTS (include author, title, name of publication, volume, pages and date of publication)   |    |   |                       |
|   | DC | Lewis RJ, Hanawalt PC. "Ligation of oligonucleotides by pyrimidine dimers--a missing 'link' in the origin of life?" 22:298(5872):393-6.   |                       |
|   | DD | Liu J, Taylor JS. "Template-directed photoligation of oligodeoxyribonucleotides via 4-thiothymidine". Nucleic Acids Res. 1998 Jul 1;26(13):3300-4   |                       |
|   | DE | Fujimoto et al. "Template-directed photoreversible ligation of deoxyoligonucleotides via 5-Vinyldeoxyuridine" J. Am. Soc. 2000, 122, 5646-5647  |                       |
|   | DF | Kenzo Fujimoto, Shigeo Matsuda, Naoki Ogawa, Masayuki Hayashi & Isao Saito<br>"Template-directed reversible photocircularization of DNA via 5-vinyldeoxycytidine".<br>TETRAHEDRON LETTERS 2000 , 41:33:6451-6454                    |                       |
|   | DG | Kenzo Fujimoto, Naoki Ogawa, Masayuki Hayashi, Shigeo Matsuda & Isao Saito<br>"Template directed photochemical synthesis of branched oligodeoxynucleotides via 5-carboxyvinyldeoxyuridine". Tetrahedron letters 2000, 41:49:9437-40 |                       |
|   | DH | Letsinger et al. "Chemical Ligation of oligonucleotides in the presence and absence of a template". J. Amer. Chem. Soc. 1993, 115, 3808-9   |                       |
|   | DI | Gryaznov SM, Letsinger RL. "Template controlled coupling and recombination of oligonucleotide blocks containing thiophosphoryl groups". Nucleic Acids Res. 1993 Mar 25;21(6):1403-8   |                       |
|   | DJ | Gryaznov SM, Schultz R, Chaturvedi SK, Letsinger RL. "Enhancement of selectivity in recognition of nucleic acids via chemical autoligation". Nucleic Acids Res. 1994 Jun 25;22(12):2366-9.  |                       |
|   | DK | Herrlein MK, Letsinger RL. "Selective chemical autoligation on a double-stranded DNA template". Nucleic Acids Res. 1994 Nov 25;22(23):5076-8  |                       |
|   | DL | Letsinger, RL; Wu, T; Elghanian, R "Chemical and photochemical ligation of oligonucleotide blocks". Nucleosides and nucleotides, 16(5&6), 643-652 (1997)  |                       |
|   | DM | Visscher J, Schwartz AW "Template-directed synthesis of acyclic oligonucleotide analogues". J Mol Evol. 1988 Dec-1989 Feb;28(1-2):3-6.  |                       |
|   | DN | Visscher J, Bakker CG, van der Woerd R, Schwartz AW "Template-directed oligomerization catalyzed by a polynucleotide analog". Science. 1989 Apr 21;244(4902):329-31.  |                       |
|   | DO | Visscher J, van der Woerd R, Bakker CG, Schwartz AW. "Oligomerization of deoxynucleoside-bisphosphate dimers: template and linkage specificity". Orig Life Evol Biosph. 1989;19(1):3-6.   |                       |
|   | DP | Zhan, ZJ and Lynn, DG "Chemical Amplification through template-directed synthesis". J. Am. Chem. Soc. 1997, 119, 12420-1  |                       |
|   | DO | Bruick RK, Koppitz M, Joyce GF, Orgel LE. "A simple procedure for constructing 5'-amino-terminated oligodeoxynucleotides in aqueous solution Nucleic Acids Res". 1997 Mar 15;25(6):1309-10  |                       |
|   | DR | Albagli, D; Atta, RVA; Cheng, P; Huan, B and Wood, ML. "Chemical amplification (CHAMP) by a continuous, self-replicating oligonucleotide-based system" J. Am. Chem. Soc. 1999, 121, 6954-6955. Pub. on the web 14 July 1999.        |                       |
|   | DS | Xu, Y and Kool, E "Rapid and Selective selenium-mediated autoligation of DNA strands" J. Am. Chem. Soc. 2000, 122, 9040-1 Pub. on web 08/31/2000.   |                       |
|   | DT | Xu Y, Karalkar NB, Kool ET. "Nonenzymatic autoligation in direct three-color detection of RNA and DNA point mutations". Nat Biotechnol. 2001 Feb;19(2):148-52.  |                       |
|   | DU | Li X, Zhan ZY, Knipe R, Lynn DG. "DNA-catalyzed polymerization". J Am Chem Soc. 2002 Feb 6;124(5):746-7.  |                       |
|   | DV | Czlapinski, JL and Sheppard, TL. "Nucleic acid template-directed assembly of metallosalen-DNA conjugates". J Am Chem Soc. 2001 Sep 5;123(35):8618-9 published on the web 08/10/2001   |                       |
|   | DW | Leitzel JC, Lynn DG "Template-directed ligation: from DNA towards different versatile templates". Chem Rec. 2001;1(1):53-62. Published online 30 Jan 2001.  |                       |
|   | DX | Schmidt JG, Nielsen PE, Orgel LE. "Information transfer from DNA to peptide nucleic acids by template-directed syntheses". Nucleic Acids Res. 1997 Dec 1;25(23):4792-4796.  |                       |
|   | DY | DOWER, WJ et al. "In vitro selection as a powerful tool for the applied evolution of proteins and peptides". Current Opinion in Chemical Biology, 2002, 6:390-398.  |                       |
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|   | DZ | Brenner, S and Lerner, RA . "Encoded combinatorial chemistry" Proc. Natl. Acad. Sci. USA. Vol 89, p 5381-3, June 1992.  |                       |
|   | EA | Gartner, Z; Liu, DR "The generality of DNA-templated synthesis as a basis for evolving non-natural small molecules". J Am Chem Soc. 2001 Jul 18;123(28):6961-3.   |                       |
|   | EB | David Liu. "Expanding the reaction scope of DNA-templated synthesis Angew". Chem. Int. Ed. 2002, 41, No. 10 pp. 1796-1800. Published May 15, 2002.  |                       |
|   | EC | Gartner, ZJ et al. "Multistep small-molecule synthesis programmed by DNA templates". J. AM. CHEM. SOC. Vol. 124, No. 35, 2002, 10304-10306.   |                       |
|   | ED | Calderone, CT et al. "Directing otherwise incompatible reactions in a single solution by using DNA-templated organic synthesis". Angew Chem Int Ed, 2002, 41, No. 21. 4104-4108.  |                       |
|   | EE | Bittker, JA; Phillips, KJ and Liu, DR "Recent advances in the in vitro evolution of nucleic acids". Curr Opin Chem Biol. 2002 Jun;6(3):367-74. Review. Pub. on the web 20 <sup>th</sup> March 2002.   |                       |
|   | EF | Summerer, D and Marx, A "DNA-templated synthesis: more versatile than expected". Angew Chem Int Ed Engl. 2002 Jan 4;41(1):89-90. Review.  |                       |
|   | EG | Gartner, ZJ et al. "Two enabling architectures for DNA-templated organic synthesis ". Angew. Chem Int. Ed. 2003, 42, No. 12, 1370-1375.   |                       |
|   | EH | Rosenbaum, DM et al. "Efficient and sequence-specific DNA-templated polymerization of peptide nucleic acid aldehydes". J. AM. CHEM. SOC. Vol. 125, No. 46, 2003, 13924-13925.   |                       |
|   | EI | Li, X et al. "Stereoselectivity in DNA-templated organic synthesis and its origins". J. AM. CHEM. SOC. Vol. 125, No. 34, 2003, 10188-10189.   |                       |
|   | EJ | Gordon, EM et al. "Applications of combinatorial technologies to drug discovery. 2. Combinatorial organic synthesis, library screening strategies, and future directions". Journal of Medicinal Chemistry, Vol. 37, No. 10, May 13, 1994.   |                       |
|   | EK | Otto, S et al. "Recent developments in dynamic combinatorial chemistry". Current opinion in Chemical Biology 2002, 6: 321-327.  |                       |
|   | EL | Pavia, MR. "The Chemical generation of molecular diversity". <a href="http://www.netsci.org/Science/Combichem/feature01.html">http://www.netsci.org/Science/Combichem/feature01.html</a>  |                       |
|   | EM | Braun, E, et al. "DNA-templated assembly and electrode attachment of a conducting silver wire". Nature, Vol. 391, 19 February 1998, 775-778.  |                       |
|   | EN | Tanaka, K et al. "Synthesis of a novel nucleoside for alternative DNA base pairing through metal complexation" J. Org. Chem. 1999, 64, 5002-5003.   |                       |
|   | EO | Beger, M et al. "Universal bases for hybridization, replication and chain termination", Nucleic acids research, Oxford University Press, vol. 28, no. 15, pub. 1 Aug. 2000, p2911-2914.   |                       |
|   | EP | Weizman, H et al. "2,2'-Bipyridine ligandosome: a novel building block for modifying DNA with intra-duplex metal complexes". J. Am. Chem. Soc. 2001, 123, 3375-3376.  |                       |
|   | EQ | Frutos, AG et al. "Demonstration of a word design strategy for DNA computing on surfaces". Nucleic Acids Research, 1997, Vol. 25, No. 23, 4748-4757.  |                       |
|   | ER | Loweth, CJ et al. "DNA-based assembly of gold nanocrystals". Angew. Chem. Int. Ed. 1999, 38, No. 12. 1808-1812.   |                       |
|   | ES | Elghanian, R et al. "Selective colorimetric detection of polynucleotides based on the distance-dependent optical properties of gold nanoparticles". Science, Vol. 277, 22 August 1997,.   |                       |
|   | ET | Storhoff, JJ and Mirkin, CA. "Programmed Materials Synthesis with DNA". Chem Rev. 1999 Jul 14;99(7):1849-1862.  |                       |
|   | EU | Mirkin CA. "Programming the assembly of two- and three-dimensional architectures with DNA and nanoscale inorganic building blocks". Inorg Chem. 2000 May 29;39(11):2258-72.   |                       |
|   | EV | Waybright SM, Singleton CP, Wachter K, Murphy CJ, Bunz UH. "Oligonucleotide-directed assembly of materials: defined oligomers". J Am Chem Soc. 2001 Mar 7;123(9):1828-33. Pub. on web 02/07/2001.   |                       |
|   | EW | Bruce Smith and Markus Krummenacker "DNA-guided assembly of proteins as a pathway to an assembler", ( <a href="http://www.wadsworth.org/albcon97/abstract/krummena.htm">http://www.wadsworth.org/albcon97/abstract/krummena.htm</a> ); 1997 Albany Conference: Biomolecular Motors and Nanomachines |                       |
|   | EX | DeWitt, SH et al. "Diversomers": an approach to nonpeptide, nonoligomeric chemical diversity". Proc. Natl. Acad. Sci, USA, Vol. 90, pp. 6909-6913, August 1993.   |                       |
|   | EY | Nielsen, J et al. "Synthetic methods for the implementation of encoded combinatorial chemistry". J. Am. Chem. Soc. 1993, 115, 9812-9813.  |                       |
|   | EZ | Ohlmeyer, MHJ et al. "Complex synthetic chemical libraries indexed with molecular tags". Proc. Natl. Acad. Sci, USA, Vol. 90, pp. 10922-10926, Dec. 1993, Chemistry.  |                       |
|   | FA | Zuckermann, RN et al. "Discovery of nanomolar ligands for 7-transmembrane G-protein-coupled receptors from a diverse N-(substituted) glycine peptoid library". J. Med. Chem. 1994, 37, 2678-2685.   |                       |
|   | FB | Luo, P et al. "Analysis of the structure and stability of a backbone-modified oligonucleotide: implications for avoiding product inhibition in catalytic template-directed synthesis". J. Am. Chem. Soc. 1998, 120, 3019-3031   |                       |
|   | FC | Luther, A et al. "Surface-promoted replication and exponential amplification of DNA analogues". Nature, Vol. 396, 19 November 1998, 245-248.  |                       |
|   | FD | Klekota, B et al. "Selection of DNA-Binding Compounds via Multistage Molecular Evolution". Tetrahedron 55 (1999) 11687-11697.   |                       |
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|  |  | FILING DATE: February 28, 2006 | ART UNIT: 1623        |
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| FE   | Furlan, RLE et al. "Molecular amplification in a dynamic combinatorial library using non-covalent interactions". Chem. Commun., 2000, 1761-1762.   |                                |                       |
| FF   | Ramström, O et al. "In situ generation and screening of a dynamic combinatorial carbohydrate library against concanavalin A". ChemBioChem, 2000, 1, 41-48.   |                                |                       |
| FG   | Cousins, GRL et al. "Identification and Isolation of a Receptor for N-Methyl Alkylammonium Salts: Molecular Amplification in a Pseudo-peptide Dynamic Combinatorial Library". Angew. Chem. Int. Ed., 2001, 40, No. 2, 423-427. |                                |                       |
| FH   | Roberts, SI et al. "Simultaneous selection, amplification and isolation of a pseudo-peptide receptor by an immobilised N-methyl ammonium ion template". Chem. Commun., 2002, 938-939.  |                                |                       |
| FI   | Doyon, J.B et al. "Highly sensitive in vitro selections for DNA-linked synthetic small molecules with protein binding affinity and specificity" J. AM. CHEM. SOC, September 16, 2003.  |                                |                       |
| FJ   | Kanan, M.W et al. "Reaction discovery enabled by DNA-templated synthesis and in vitro selection" Nature, Vol. 431, 30 September 2004.  |                                |                       |
| FI   | "Finding reactions in a haystack: Try'em all, see what works" Meeting American Chemical Society, 10 September 2004, Vol. 305, Science.   |                                |                       |
| FL   | "The Nucleus", January 2004, Vol. LXXXII, No. 5, R. Grubina; "Summer Research Report: R. Grubina on DNA Templated Synthesis for Small Molecule Library", p10-14  |                                |                       |
| FM   | Nazarenko et al., "A closed tube format for amplification and detection of DNA based on energy transfer", Nucleic Acids Research, 1997, Vol. 25, No. 12, p2516-2521  |                                |                       |
| FN   | Chan et al., "Intra-tRNA distance measurements for nucleocapsid protein-dependent tRNA unwinding during priming of HIV reverse transcription", PNAS Vol. 96, p459-464, January 1999.   |                                |                       |
| FO   | Liu DR ET AL., DNA-templated synthesis as a basis for the evolution of synthetic molecules, ABSTRACTS OF PAPERS OF THE AMERICAN CHEMICAL SOCIETY, 225: 612-ORGN, Part 2, MAR 2003  |                                |                       |
| FP   | Rodriguez et al., "Template-directed extension of a guanosine 5'-phosphate covalently attached to an oligodeoxycytidylate template", J Mol Evol (1991) 33:477-482  |                                |                       |
| FQ   | Acevedo et al., "Template-directed oligonucleotide ligation on hydroxylapatite", Nature vol. 321, 19 June 1986, p790-792   |                                |                       |
| FR   | Piccirilli, "RNA seeks its maker", Nature vol. 376, 17 August 1995, p548-  |                                |                       |
| FS   | A. W. Schwartz et al., "Template-directed synthesis of novel, nucleic acid-like structures", Science 1985, 228, 585-7  |                                |                       |
| FT   | Halpin et al.: DNA display III. Solid-phase organic synthesis on unprotected DNA. PLoS Biol. 2004 Jul;2(7):E175. Epub 2004 Jun 22.   |                                |                       |
| FU   | Halpin et al.: DNA display II. Genetic manipulation of combinatorial chemistry libraries for small-molecule evolution. PLoS Biol. 2004 Jul;2(7):E174. Epub 2004 Jun 22.  |                                |                       |
| FV   | Halpin et al.: DNA display I. Sequence-encoded routing of DNA populations. PLoS Biol. 2004 Jul;2(7):E173. Epub 2004 Jun 22   |                                |                       |
| FW   | "Highly Sensitive In Vitro Selections for DNA-Linked Synthetic Small Molecules with Protein Binding Affinity and Specificity" Doyon, J. B.; Snyder, T. M.; Liu, D. R. J. Am. Chem. Soc. 125, 12372-12373 (2003).               |                                |                       |
| FX   | "Translation of DNA into Synthetic N-Acyloxazolidines" Li, X.; Gartner, Z. J.; Tse, B. N.; Liu, D. R. J. Am. Chem. Soc. 126, 5090-5092 (2004).   |                                |                       |
| FY   | "DNA-Templated Organic Synthesis: Nature's Strategy for Controlling Chemical Reactivity Applied to Synthetic Molecules" Li, X.; Liu, D. R. Angew. Chem. Int. Ed. 43, 4848-4870 (2004).   |                                |                       |
| FZ   | "DNA-Templated Organic Synthesis and Selection of a Library of Macrocycles" Gartner, Z. J.; Tse, B. N.; Grubina, R.; Doyon, J. B.; Snyder, T. M.; Liu, D. R. Science 305, 1601-1605 (2004).                                    |                                |                       |
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| GB   | "DNA-Templated Functional Group Transformations Enable Sequence-Programmed Synthesis Using Small-Molecule Reagents" Sakurai, K.; Snyder, T. M.; Liu, D. R. J. Am. Chem. Soc. 127, 1660-1661 (2005).                            |                                |                       |
| GC   | "Translating DNA into synthetic Molecules", David R. Liu, PLoS Biology, July 2004, Vol 2, Iss. 7, p905-6.  |                                |                       |
| GO   | "The Development of Amplifiable and Evolvable Unnatural Molecules", David R. Liu, Harvard Univ. Cambridge MA Dept of Chemistry and Chemical Biology, Report dated 4 Aug 2003 No. A104614, approved for public release.         |                                |                       |
| GE   | Website of Prof. David R. Liu, publicly available 11 March 2000  |                                |                       |
| GF   | Website of Prof. David R. Liu, publicly available 15 Oct 2000  |                                |                       |
| GG   | Website of Prof. David R. Liu, publicly available 1 March 2001   |                                |                       |
| GH   | Website of Prof. David R. Liu, publicly available 19 April 2001  |                                |                       |
| GI   | Website of Prof. David R. Liu, publicly available 23 Sept 2001   |                                |                       |
| GJ   | Website of Prof. David R. Liu, publicly available 24 Sept. 2002  |                                |                       |
| GK   | Website of Prof. David R. Liu, publicly available 20 Nov 2002  |                                |                       |
| GL   | Website of Prof. David R. Liu, publicly available 15 Oct 2003  |                                |                       |
| GM   | Inoue et al., "Oligomerization of (Guanosine 5'-phosphor)-2-methylimidazole on Poly(C)", J. Mol. Biol. (1982), 162, 201-217  |                                |                       |
| GN   | C. B. Chen et al., "Template-directed synthesis on Oligodeoxycytidylate and Polydeoxycytidylate templates" J. Mol. Biol. 1985, 181, 271  |                                |                       |
| GO   | H. Rembold et al., "Single-strand regions of Poly(G) act as templates for oligo(C) synthesis" J. Mol. Evol. 1994, 38, 205.   |                                |                       |
| GP   | T. Inoue et al., "A nonenzymatic RNA polymerase model", Science 1983, 219, p859-862  |                                |                       |
| GQ   | O. L. Acevedo et al., "Non-enzymatic transcription of an oligonucleotide 14 residues long", J. Mol. Biol. 1987, 197, p187-193  |                                |                       |
| GR   | C. Böhrer et al., "Template switching between PNA and RNA oligonucleotides", Nature 1995, 376, 578-581   |                                |                       |
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